Guest Editorial Preface

Special Issue on International Conference on Recent Trends in Image Processing and Pattern Recognition (rtip2r), 2016

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With the goal to attract current and/or decent research on image processing, pattern recognition, and computer vision, International Conference on Recent trends in Image Processing and Pattern Recognition (rtip2r), 2016 was successful, and left us with a quality proceedings having an acceptance rate of 33%. Having review reports in hands, on behalf of the rtip2r 2016 committee, I have selected high quality manuscripts for this special issue in International Journal of Computer Vision and Image Processing (IJCVIP). Together with the Editor-in-Chief (EIC), I, as a guest editor, worked with the anonymous reviewers and have made decisions based on double blind peer review process. The recommendations (by our anonymous reviewers) have solely taken into account for a decision-making process. In this issue, we have a set of high quality manuscripts with several applications: biometrics, (bio)medical imaging, texture analysis, document analysis and recognition, and data analysis, in the domain: pattern analysis and machine intelligence. Following is the summary the papers for this issue:

- **A Deep Learning Approach for Hepatocellular Carcinoma Grading:** To avoid medical invasive procedures such as biopsies, Computer Aided Decision (CAD) systems based on Medical Imaging could support radiologists in grading Hepatocellular carcinoma (HCC) by means of Computed Tomography (CT) images. Authors studied lesions, which is an important phase allowing an easier classification in two classes of HCCs. In this study, authors have used abdominal CT hepatic lesion from 18 patients subjected to liver transplant, partial hepatectomy, or US-guided needle biopsy. For this task, a deep learning approach using Convolutional Neural Network (CNN) was used for HCC grading;
- **Face Match for Family Reunification: Real-World Face Image Retrieval:** Authors developed a single-image-per-person (SIPP) query-by-photo methodology (FaceMatch) working with unconstrained images of variable quality, implemented it as a cross-platform software library, exposing its face localization and image retrieval functionality via web-services, which are consumed by real-world applications, such as efficient photo collection search for the disasters management. This is a practical system that handles web-scale photo collections with real-world images. In this study, a SIPP approach uses weighted image descriptor ensemble to optimize the matching accuracy without training, where MEADOW key-point filtering, attribute bucketing and FLANN indexing helped speed-up queries up to 20-times (compared to the linear search), keeping turn-around time within one second for a typical real-world collection. Also, authors observed that face detection can be improved by using human skin tone information and facial

landmarks along with default (color-blind) face detection algorithm, where the skin regions are mapped using an artificial neural network (ANN). Authors have also mentioned that FaceMatch has shown certain robustness in cross-ethnicity face queries, retrieving visually similar other-ethnicity photos faster and at times more reliably than a hospital worker could under the stress of an emergency. This could help save time and effort for the disaster event managers and for people who search for their missing relatives;

- **Foreign Circular Element Detection in Chest X-Rays for Effective Automated Pulmonary Abnormality Screening:** In this work, authors have developed a novel technique to identify circular foreign element such as buttons, coins appearing in lung regions of the chest X-ray images. Lung diseases are major threats because significant numbers of people suffer from these diseases such as Tuberculosis (WHO, 2014 and 2015), pneumonia, lung cancer and pulmonary edema across the world. The advent of new powerful hardware and software techniques has triggered attempts to develop computer-aided diagnostic (CAD) systems for automatic chest x-ray. However, foreign element such as buttons on the gown that the patients were wearing or coins/buttons mistakenly swallowed by patients, within the chest x-ray images hinders the performance of the automatic screening process. The presence of such element (especially the ones located within the lung region) hinders the CAD system performance, as they are not due to any lung abnormalities and therefore should not be considered. Authors claimed that the proposed technique is encouraging, both in terms of detection accuracy and computational time;
- **Performance Analysis of Anisotropic Diffusion Based Color Texture Descriptors in Industrial Applications:** In this paper, authors proposed an effective method for color texture analysis using anisotropic diffusion based texture descriptors to be potentially used in industrial applications. The color texture: grading of granite tiles and wood textures is considered. Their experiments were carried on different color spaces: RGB, HSV, YCbCr and Lab, and is compared with that on gray scale. They observed that the choice of color space for texture analysis is crucial and application-dependent. Their experimental results demonstrated the effectiveness of the proposed method in terms of classification accuracy and reduced feature set size;
- **Feature Selection of Interval Valued Data Through Interval K-Means Clustering:** In this study, authors introduced a novel feature selection model for supervised interval valued data based on interval K-Means clustering. They have studied two kinds of feature selection through feature clustering viz., class independent feature selection and class dependent feature selection. Four standard benchmarking datasets and three symbolic classifiers have been used for validation. The effectiveness of the proposed method has been attested with the help of a comprehensive comparison study;
- **Word-Level Multi-Script Indic Document Image Dataset and Baseline Results on Script Identification:** Authors have shown the importance of automatic multi-script document processing for a country like India, where 23 different official languages (including English) are present and 11 different scripts are used to write them. Optical character recognitions (OCRs) are script-dependent, and therefore script identification system (SIS) can be taken as a precursor. In this paper, authors presented a database that is composed of 13 different languages from 11 different scripts, and therefore one make a fair comparison with state-of-the-art methods. They have also tested and provided baseline results by using several different state-of-the-art classifiers such as multilayer perceptron, support vector machine and Bayesian networks.

In conclusion, I am sure that these research articles will impact the research community and attract research scientists in the domain: image processing, pattern analysis and machine intelligence.

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K. C. Santosh is an Assistant Professor for the Department of Computer Science, the University of South Dakota (USD). Before joining the USD, from 2013 to 2015, Dr. KC worked as a research fellow at the U.S. National Library of Medicine (NLM), National Institutes of Health (NIH). He worked as a postdoctoral research scientist at the LORIA research centre, Universite de Lorraine in direct collaboration with industrial partner ITESOFT, France, for 2 years. He also worked as a research scientist at the INRIA Nancy Grand Est research centre for 3 years, until 2011. Dr. KC has demonstrated expertise in pattern recognition, image processing, computer vision and machine learning with various applications in handwriting recognition, graphics recognition, document information content exploitation, medical image analysis and biometrics. Dr. KC published more than 80 research articles, including a book section in encyclopedia of electrical and electronics engineering. Dr. KC is an assoc. editor of Int. J. of Machine Learning & Cybernetics (JMLC), Springer and J. of Pattern Recognition Research (JPRR), serves on the editorial board member of SpringerPlus, Int. J. Computer Vision and Image Proc. (IJCVIP), Frontiers in ICT: Computer Image Analysis, Cultural Heritage Digitization: Frontiers in Digital Humanities, and served as a review panel for Natural Science and Engineering Research Councils (NSERC) of Canada and National Science Foundation (NSF).